

# Surface Mount Bandpass Filter

50Ω 60 to 90 MHz

BPF-C75+



Generic photo used for illustration purposes only  
CASE STYLE: HU1186

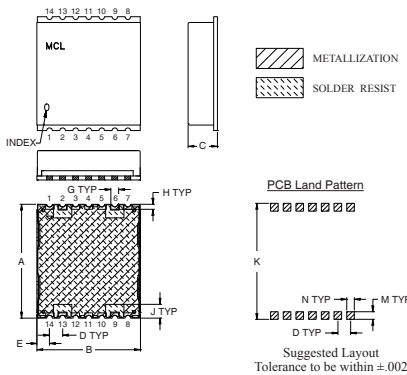
## Maximum Ratings

|                                                                 |                |
|-----------------------------------------------------------------|----------------|
| Operating Temperature                                           | -40°C to 85°C  |
| Storage Temperature                                             | -55°C to 100°C |
| RF Power Input                                                  | 0.5W Max.      |
| Permanent damage may occur if any of these limits are exceeded. |                |

## Pin Connections

|               |                                  |
|---------------|----------------------------------|
| INPUT         | 2                                |
| OUTPUT        | 9                                |
| NOT CONNECTED | 6, 13                            |
| GROUND        | 1, 3, 4, 5, 7, 8, 10, 11, 12, 14 |

## Outline Drawing

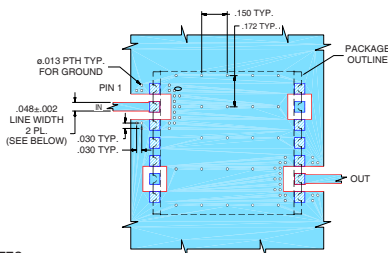


## Outline Dimensions (inch/mm)

| A     | B     | C    | D    | E    | G    | H    | J    | K     | M    | N    | wt.   |
|-------|-------|------|------|------|------|------|------|-------|------|------|-------|
| .870  | .800  | .25  | .100 | .097 | .060 | .040 | .105 | .910  | .060 | .060 | grams |
| 22.10 | 20.32 | 6.35 | 2.54 | 2.46 | 1.52 | 1.02 | 2.67 | 23.11 | 1.52 | 1.52 | 2.85  |

Note: Please refer to case style drawing for details

**Demo Board MCL P/N: TB-500+**  
**Suggested PCB Layout (PL-294)**



### NOTES:

- TRACE WIDTH IS SHOWN FOR ROGERS RO4350B, DIELECTRIC THICKNESS: .030"±.002"; COPPER: 1/2 OZ EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
  - BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)  
 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

## Features

- High rejection
- Good VSWR, 1.2:1 typ @ passband
- Shielded case
- Aqueous washable

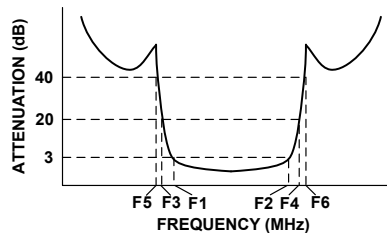
## Applications

- Industrial microwave and RF
- Receivers / transmitters
- Harmonic rejection

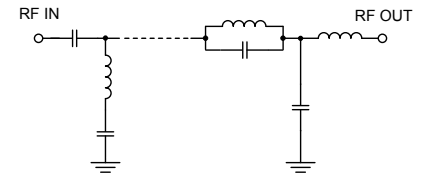
## Bandpass Filter Electrical Specifications (T<sub>AMB</sub> = 25°C)

| CENTER FREQ. (MHz) | PASSBAND (MHz)<br>(Loss < 3dB)  | STOPBANDS (MHz) |                |                |                | VSWR (:1) |      |          |
|--------------------|---------------------------------|-----------------|----------------|----------------|----------------|-----------|------|----------|
|                    |                                 | Loss > 20dB     |                | Loss > 40dB    |                | Passband  |      | Stopband |
| F <sub>c</sub>     | F <sub>1</sub> - F <sub>2</sub> | F <sub>3</sub>  | F <sub>4</sub> | F <sub>5</sub> | F <sub>6</sub> | Typ.      | Max. | Typ.     |
| 75                 | 60 - 90                         | 46              | 102            | 42             | 108 - 1800     | 1.2       | 1.6  | 18       |

## Typical Frequency Response

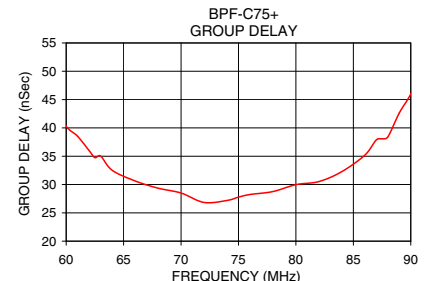
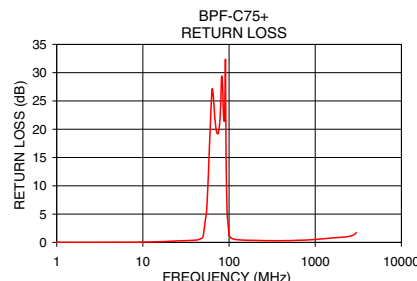
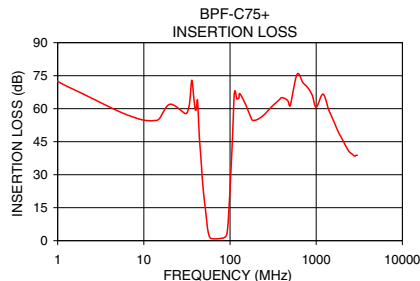


## Functional Schematic



## Typical Performance Data at 25°C

| Frequency (MHz) | Insertion Loss (dB) |          | Return Loss (dB) | Frequency (MHz) | Group Delay (nSec) |
|-----------------|---------------------|----------|------------------|-----------------|--------------------|
|                 | $\bar{x}$           | $\sigma$ |                  |                 |                    |
| 0.5             | 79.67               | 1.09     | 0.01             | 60.0            | 40.28              |
| 42.0            | 63.82               | 3.90     | 0.41             | 62.0            | 35.98              |
| 46.0            | 37.45               | 5.83     | 0.59             | 64.0            | 32.52              |
| 53.0            | 11.02               | 3.22     | 3.86             | 66.0            | 30.64              |
| 55.0            | 5.30                | 2.56     | 5.74             | 68.0            | 29.36              |
| 57.0            | 2.41                | 1.17     | 10.55            | 70.0            | 28.50              |
| 60.0            | 1.06                | 0.16     | 19.07            | 72.0            | 26.84              |
| 66.0            | 0.83                | 0.05     | 25.39            | 74.0            | 27.19              |
| 75.0            | 0.95                | 0.04     | 19.29            | 75.0            | 27.77              |
| 80.0            | 1.10                | 0.05     | 24.31            | 76.0            | 28.24              |
| 90.0            | 2.09                | 0.09     | 26.65            | 78.0            | 28.76              |
| 93.0            | 4.17                | 0.46     | 12.07            | 80.0            | 29.98              |
| 95.0            | 8.13                | 0.86     | 5.05             | 82.0            | 30.52              |
| 97.0            | 14.22               | 0.93     | 3.53             | 84.0            | 32.29              |
| 102.0           | 30.02               | 1.06     | 1.07             | 86.0            | 35.19              |
| 108.0           | 51.30               | 1.66     | 0.67             | 87.0            | 37.89              |
| 500.0           | 61.34               | 5.48     | 0.31             | 88.0            | 38.39              |
| 1800.0          | 49.59               | 0.61     | 0.85             | 90.0            | 45.97              |



### Notes

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190817  
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# Surface Mount Band Pass Filter

**BPF-C75+**

## Typical Performance Data

| FREQ.<br>(MHz) | INSERTION LOSS<br>(dB) |          |          | INPUT RETURN LOSS<br>(dB) |          |          | OUTPUT RETURNLOSS<br>(dB) |          |          |
|----------------|------------------------|----------|----------|---------------------------|----------|----------|---------------------------|----------|----------|
|                | @ -40° C               | @ +25° C | @ +85° C | @ -40° C                  | @ +25° C | @ +85° C | @ -40° C                  | @ +25° C | @ +85° C |
| 0.5            | 78.24                  | 78.14    | 77.80    | 0.00                      | 0.00     | 0.00     | 0.00                      | 0.01     | 0.01     |
| 10             | 54.52                  | 54.55    | 54.50    | 0.00                      | 0.01     | 0.00     | 0.03                      | 0.05     | 0.06     |
| 20             | 59.90                  | 59.67    | 60.01    | 0.01                      | 0.02     | 0.02     | 0.15                      | 0.18     | 0.21     |
| 30             | 57.98                  | 57.99    | 58.19    | 0.04                      | 0.05     | 0.05     | 0.30                      | 0.33     | 0.35     |
| 40             | 61.89                  | 61.61    | 61.54    | 0.11                      | 0.12     | 0.14     | 0.39                      | 0.44     | 0.49     |
| 42             | 63.96                  | 63.85    | 64.56    | 0.14                      | 0.15     | 0.17     | 0.41                      | 0.47     | 0.53     |
| 46             | 40.96                  | 40.54    | 40.21    | 0.22                      | 0.24     | 0.27     | 0.49                      | 0.57     | 0.64     |
| 50             | 23.73                  | 23.52    | 23.40    | 0.39                      | 0.42     | 0.47     | 0.71                      | 0.79     | 0.86     |
| 52             | 16.69                  | 16.52    | 16.47    | 0.62                      | 0.68     | 0.74     | 0.99                      | 1.07     | 1.15     |
| 53             | 13.35                  | 13.21    | 13.17    | 0.87                      | 0.94     | 1.02     | 1.26                      | 1.35     | 1.44     |
| 54             | 10.18                  | 10.05    | 10.03    | 1.32                      | 1.42     | 1.52     | 1.73                      | 1.85     | 1.95     |
| 55             | 7.27                   | 7.16     | 7.15     | 2.14                      | 2.29     | 2.44     | 2.58                      | 2.75     | 2.89     |
| 56             | 4.82                   | 4.74     | 4.74     | 3.61                      | 3.85     | 4.09     | 4.07                      | 4.33     | 4.56     |
| 57             | 3.01                   | 2.96     | 2.99     | 6.07                      | 6.46     | 6.85     | 6.55                      | 6.98     | 7.37     |
| 58             | 1.89                   | 1.89     | 1.94     | 9.84                      | 10.48    | 11.12    | 10.31                     | 11.01    | 11.74    |
| 60             | 1.06                   | 1.12     | 1.20     | 24.51                     | 26.91    | 29.14    | 23.88                     | 26.79    | 31.27    |
| 66             | 0.81                   | 0.87     | 0.94     | 22.28                     | 22.84    | 23.79    | 25.14                     | 26.47    | 28.48    |
| 70             | 0.80                   | 0.87     | 0.95     | 21.10                     | 20.61    | 20.20    | 22.50                     | 22.01    | 21.40    |
| 75             | 0.89                   | 0.97     | 1.07     | 17.95                     | 17.41    | 16.81    | 18.12                     | 17.51    | 16.75    |
| 80             | 0.96                   | 1.04     | 1.14     | 22.48                     | 22.29    | 22.09    | 22.23                     | 21.88    | 21.28    |
| 85             | 1.19                   | 1.29     | 1.41     | 26.01                     | 25.30    | 24.35    | 24.73                     | 23.93    | 22.64    |
| 90             | 1.82                   | 1.98     | 2.17     | 26.75                     | 27.16    | 27.32    | 23.53                     | 22.26    | 20.76    |
| 93             | 3.82                   | 4.18     | 4.53     | 8.85                      | 8.56     | 8.42     | 8.33                      | 7.93     | 7.64     |
| 95             | 7.94                   | 8.46     | 8.94     | 3.92                      | 3.87     | 3.89     | 3.36                      | 3.28     | 3.24     |
| 97             | 13.78                  | 14.33    | 14.83    | 2.25                      | 2.30     | 2.37     | 1.65                      | 1.68     | 1.71     |
| 100            | 23.19                  | 23.70    | 24.16    | 1.56                      | 1.62     | 1.70     | 0.92                      | 0.97     | 1.02     |
| 102            | 29.52                  | 30.01    | 30.44    | 1.39                      | 1.45     | 1.52     | 0.75                      | 0.80     | 0.85     |
| 105            | 39.29                  | 39.79    | 40.17    | 1.24                      | 1.30     | 1.37     | 0.61                      | 0.67     | 0.72     |
| 108            | 49.76                  | 50.24    | 50.67    | 1.14                      | 1.19     | 1.25     | 0.54                      | 0.59     | 0.64     |
| 110            | 57.02                  | 57.61    | 57.85    | 1.08                      | 1.13     | 1.19     | 0.51                      | 0.56     | 0.60     |
| 120            | 61.36                  | 61.28    | 61.46    | 0.84                      | 0.90     | 0.95     | 0.43                      | 0.47     | 0.51     |
| 130            | 61.97                  | 62.29    | 62.17    | 0.70                      | 0.75     | 0.79     | 0.39                      | 0.43     | 0.46     |
| 140            | 77.56                  | 78.04    | 77.65    | 0.63                      | 0.66     | 0.71     | 0.37                      | 0.41     | 0.43     |
| 150            | 63.35                  | 63.17    | 63.47    | 0.60                      | 0.62     | 0.66     | 0.35                      | 0.39     | 0.41     |
| 160            | 58.41                  | 58.40    | 58.39    | 0.59                      | 0.61     | 0.64     | 0.34                      | 0.38     | 0.40     |
| 170            | 56.29                  | 56.39    | 56.26    | 0.60                      | 0.61     | 0.64     | 0.32                      | 0.37     | 0.40     |
| 180            | 55.45                  | 55.45    | 55.46    | 0.61                      | 0.62     | 0.65     | 0.31                      | 0.36     | 0.40     |
| 190            | 55.17                  | 55.19    | 55.31    | 0.63                      | 0.64     | 0.67     | 0.31                      | 0.36     | 0.39     |
| 200            | 55.38                  | 55.45    | 55.47    | 0.65                      | 0.66     | 0.69     | 0.30                      | 0.36     | 0.39     |
| 300            | 62.80                  | 62.93    | 62.55    | 0.69                      | 0.77     | 0.83     | 0.25                      | 0.33     | 0.37     |
| 400            | 69.91                  | 70.24    | 69.39    | 0.74                      | 0.83     | 0.91     | 0.24                      | 0.33     | 0.38     |
| 500            | 68.51                  | 68.52    | 67.78    | 0.79                      | 0.90     | 0.99     | 0.25                      | 0.35     | 0.41     |
| 600            | 73.46                  | 74.48    | 75.38    | 0.85                      | 0.99     | 1.08     | 0.26                      | 0.38     | 0.45     |
| 700            | 92.55                  | 85.35    | 89.07    | 0.93                      | 1.08     | 1.19     | 0.28                      | 0.42     | 0.49     |
| 800            | 74.07                  | 74.10    | 73.34    | 1.00                      | 1.18     | 1.30     | 0.30                      | 0.46     | 0.54     |
| 900            | 66.00                  | 66.07    | 66.46    | 1.07                      | 1.26     | 1.41     | 0.33                      | 0.50     | 0.58     |
| 1000           | 62.06                  | 63.40    | 64.44    | 1.14                      | 1.34     | 1.50     | 0.38                      | 0.56     | 0.65     |
| 1100           | 73.60                  | 77.55    | 75.87    | 1.17                      | 1.38     | 1.55     | 0.41                      | 0.61     | 0.70     |
| 1200           | 75.93                  | 73.30    | 71.71    | 1.19                      | 1.39     | 1.56     | 0.45                      | 0.66     | 0.77     |
| 1300           | 87.59                  | 69.05    | 72.41    | 1.16                      | 1.37     | 1.54     | 0.49                      | 0.71     | 0.83     |
| 1400           | 77.35                  | 75.44    | 80.30    | 1.11                      | 1.33     | 1.49     | 0.52                      | 0.76     | 0.89     |
| 1500           | 73.60                  | 70.80    | 68.96    | 1.06                      | 1.27     | 1.42     | 0.55                      | 0.81     | 0.96     |
| 1600           | 69.10                  | 70.12    | 72.88    | 1.01                      | 1.23     | 1.37     | 0.57                      | 0.85     | 1.03     |
| 1700           | 61.63                  | 64.44    | 64.13    | 0.98                      | 1.18     | 1.31     | 0.60                      | 0.89     | 1.09     |
| 1800           | 69.56                  | 68.70    | 64.90    | 0.95                      | 1.16     | 1.29     | 0.62                      | 0.91     | 1.14     |

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# Surface Mount Band Pass Filter

## BPF-C75+

### Typical Performance Data

| FREQ.<br>(MHz) | GROUP DELAY<br>(nsec) |          |          |
|----------------|-----------------------|----------|----------|
|                | @ -40° C              | @ +25° C | @ +85° C |
| 60.0           | 52.11                 | 51.57    | 51.16    |
| 61.0           | 46.56                 | 46.09    | 45.73    |
| 62.0           | 42.37                 | 42.03    | 41.74    |
| 63.0           | 39.30                 | 39.06    | 38.80    |
| 63.5           | 38.04                 | 37.86    | 37.70    |
| 64.0           | 37.01                 | 36.88    | 36.74    |
| 64.5           | 36.10                 | 35.98    | 35.88    |
| 65.0           | 35.24                 | 35.18    | 35.10    |
| 65.5           | 34.55                 | 34.46    | 34.44    |
| 66.0           | 33.91                 | 33.85    | 33.83    |
| 66.5           | 33.33                 | 33.27    | 33.25    |
| 67.0           | 32.80                 | 32.77    | 32.75    |
| 67.5           | 32.34                 | 32.32    | 32.30    |
| 68.0           | 31.96                 | 31.89    | 31.93    |
| 68.5           | 31.49                 | 31.43    | 31.43    |
| 69.0           | 31.14                 | 31.09    | 31.10    |
| 69.5           | 30.82                 | 30.79    | 30.77    |
| 70.0           | 30.49                 | 30.44    | 30.44    |
| 70.5           | 30.23                 | 30.18    | 30.14    |
| 71.0           | 29.97                 | 29.96    | 29.87    |
| 71.5           | 29.73                 | 29.67    | 29.62    |
| 72.0           | 29.50                 | 29.48    | 29.41    |
| 72.5           | 29.30                 | 29.28    | 29.21    |
| 73.0           | 29.17                 | 29.13    | 29.10    |
| 73.5           | 29.06                 | 29.03    | 28.98    |
| 74.0           | 28.97                 | 28.95    | 28.89    |
| 74.5           | 28.90                 | 28.87    | 28.81    |
| 75.0           | 28.88                 | 28.89    | 28.82    |
| 75.5           | 28.88                 | 28.90    | 28.84    |
| 76.0           | 28.95                 | 28.96    | 28.92    |
| 76.5           | 29.02                 | 29.01    | 29.00    |
| 77.0           | 29.11                 | 29.11    | 29.14    |
| 77.5           | 29.28                 | 29.31    | 29.30    |
| 78.0           | 29.44                 | 29.49    | 29.50    |
| 78.5           | 29.62                 | 29.70    | 29.69    |
| 79.0           | 29.88                 | 29.93    | 29.98    |
| 79.5           | 30.17                 | 30.21    | 30.32    |
| 80.0           | 30.46                 | 30.54    | 30.63    |
| 80.5           | 30.77                 | 30.87    | 30.95    |
| 81.0           | 31.14                 | 31.25    | 31.34    |
| 81.5           | 31.52                 | 31.63    | 31.75    |
| 82.0           | 31.91                 | 32.07    | 32.21    |
| 82.5           | 32.37                 | 32.52    | 32.65    |
| 83.0           | 32.85                 | 33.03    | 33.15    |
| 83.5           | 33.34                 | 33.56    | 33.66    |
| 84.0           | 33.92                 | 34.09    | 34.23    |
| 84.5           | 34.48                 | 34.67    | 34.83    |
| 85.0           | 35.14                 | 35.35    | 35.48    |
| 85.5           | 35.81                 | 36.04    | 36.21    |
| 86.0           | 36.60                 | 36.81    | 36.95    |
| 86.5           | 37.45                 | 37.69    | 37.87    |
| 87.0           | 38.48                 | 38.74    | 38.93    |
| 88.0           | 40.90                 | 41.24    | 41.49    |
| 89.0           | 44.24                 | 44.71    | 45.07    |
| 90.0           | 48.76                 | 49.34    | 49.81    |

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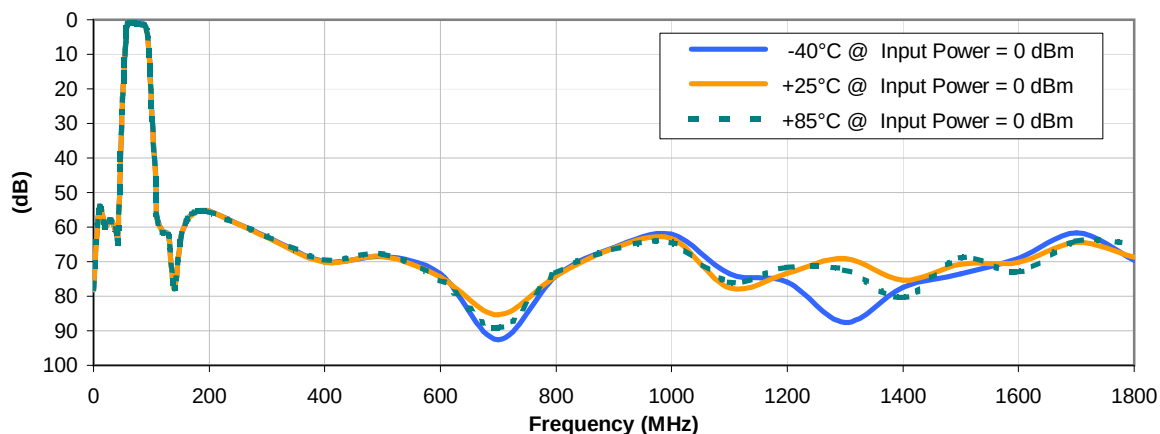


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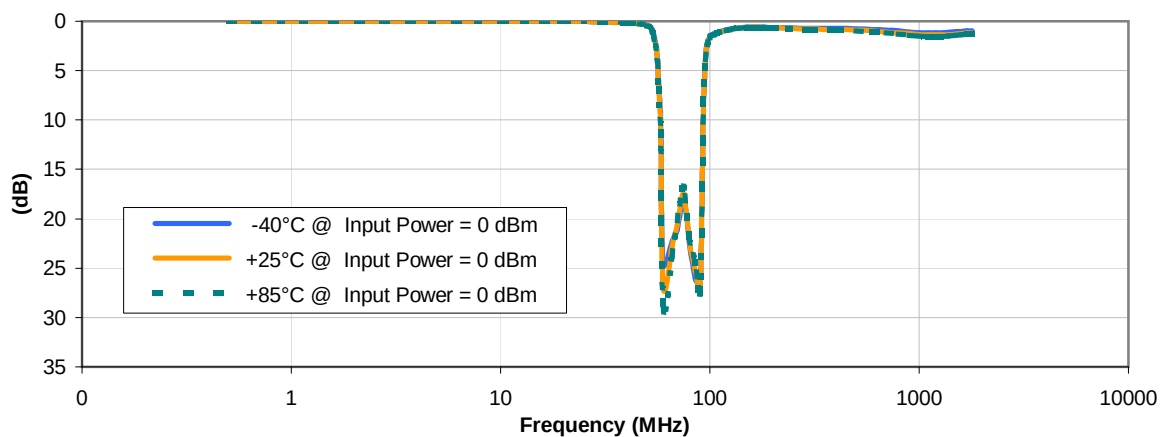


## Typical Performance Curves

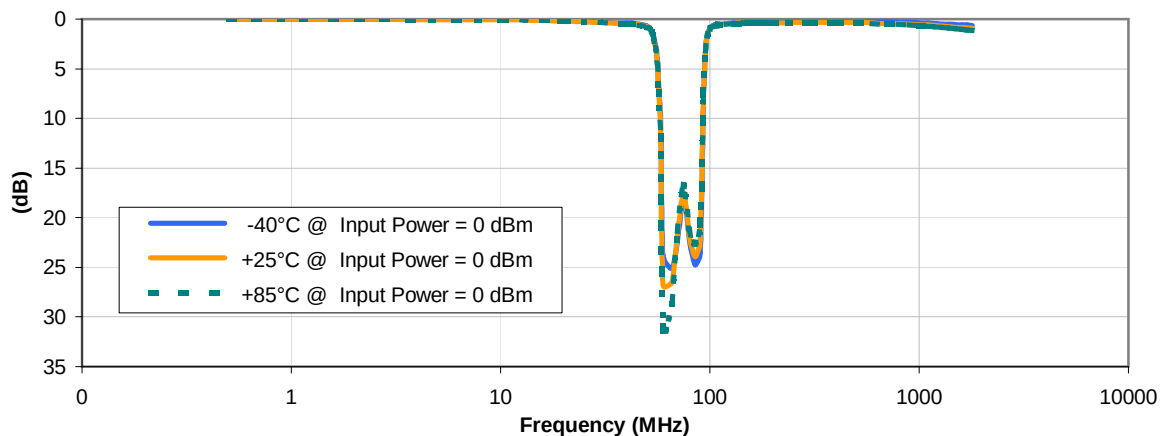
INSERTION LOSS vs. TEMPERATURE



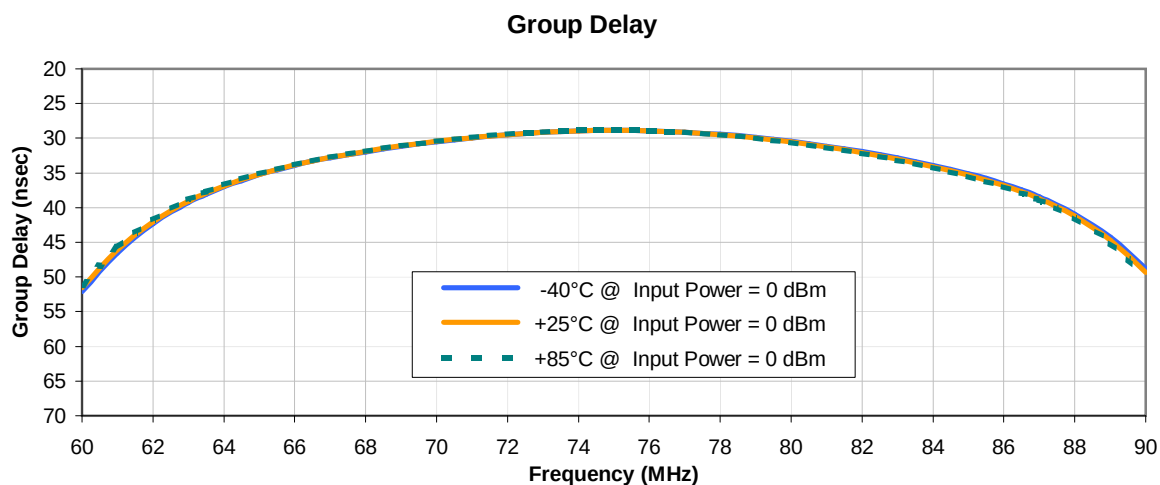
INPUT RETURN LOSS vs. TEMPERATURE



OUTPUT RETURN LOSS vs. TEMPERATURE



## Typical Performance Curves



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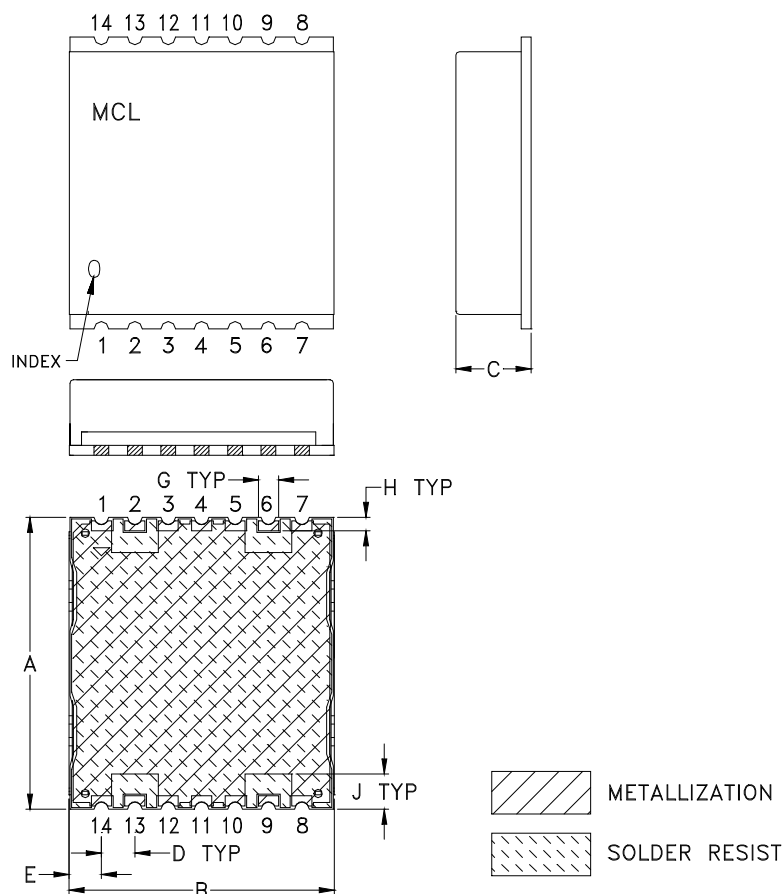


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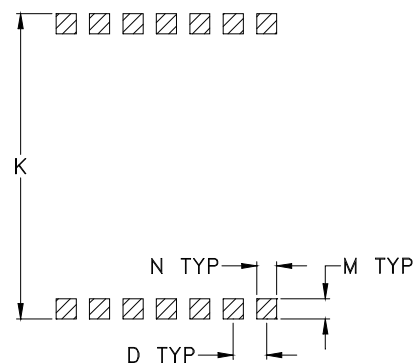


## Outline Dimensions

HU1186



## PCB Land Pattern



Suggested Layout,  
Tolerance to be within  $\pm 0.002$

| CASE#  | A               | B               | C             | D              | E              | F      | G              | H              | J              | K               | L      | M              | N              | P      | WT,<br>GRAM |
|--------|-----------------|-----------------|---------------|----------------|----------------|--------|----------------|----------------|----------------|-----------------|--------|----------------|----------------|--------|-------------|
| HU1186 | .870<br>(22.10) | .800<br>(20.32) | .25<br>(6.35) | .100<br>(2.54) | .097<br>(2.46) | -<br>- | .060<br>(1.52) | .040<br>(1.02) | .105<br>(2.67) | .910<br>(23.11) | -<br>- | .060<br>(1.52) | .060<br>(1.52) | -<br>- | 2.85        |

Dimensions are in inches (mm). Tolerances: 2PL. +/- .03; 3PL. +/- .015

### Notes:

1. Case material: Nickel-Silver alloy.
2. Base: Printed wiring laminate.
3. Termination finish:

For RoHS Case Styles: 2-5  $\mu$  inch (.05-.13 microns) Gold over 120-240  $\mu$  inch (3.05-6.10 microns) Nickel plate.  
For RoHS-5 Case Styles: Tin-Lead plate.

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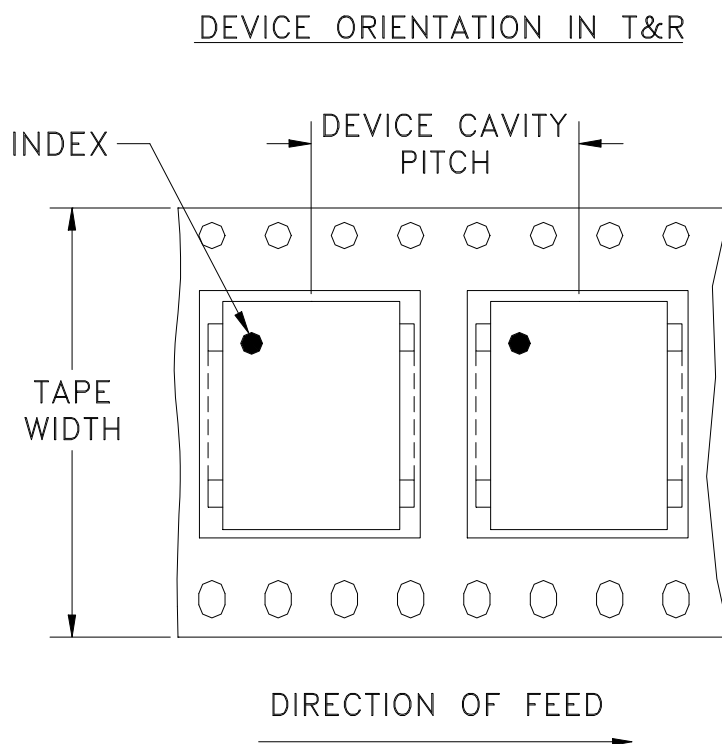
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: [www.minicircuits.com](http://www.minicircuits.com)

RF/IF MICROWAVE COMPONENTS

# Tape & Reel Packaging TR-F21



| Tape Width,<br>mm | Device Cavity<br>Pitch, mm | Reel Size,<br>inches | Devices per Reel |
|-------------------|----------------------------|----------------------|------------------|
| 32                | 32                         | 13                   | 200              |

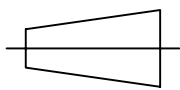
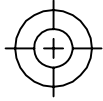
Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: [www.minicircuits.com/pages/pdfs/tape.pdf](http://www.minicircuits.com/pages/pdfs/tape.pdf)



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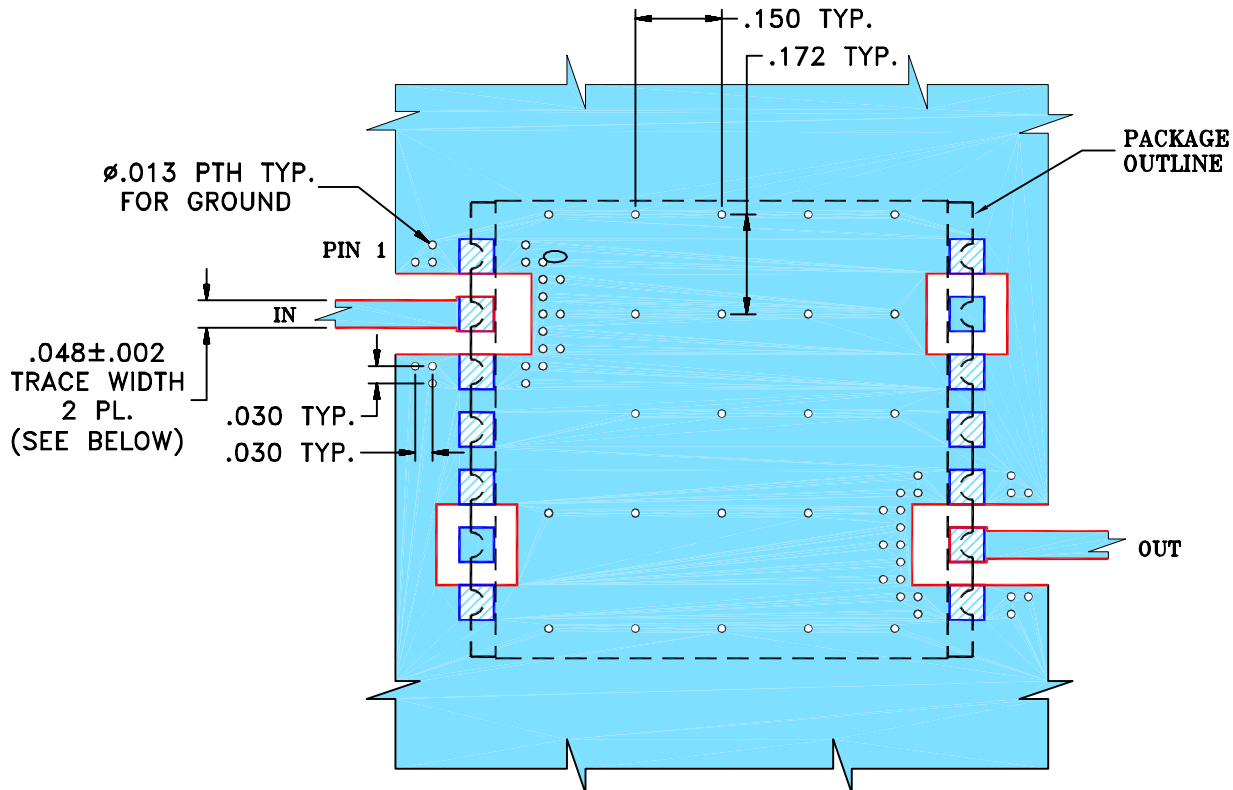
## THIRD ANGLE PROJECTION



## REVISIONS

| REV | ECN No. | DESCRIPTION              | DATE  | DR | AUTH |
|-----|---------|--------------------------|-------|----|------|
| OR  | M119979 | NEW RELEASE (FROM RAVON) | 11/08 | DK | HH   |
| OR  | R74463  | NEW RELEASE (FROM RAVON) | 11/08 | DK | HH   |
|     |         |                          |       |    |      |
|     |         |                          |       |    |      |

**SUGGESTED MOUNTING CONFIGURATION FOR  
HU1186 CASE STYLE, "14FL03" PIN CODE**



## NOTES:

- TRACE WIDTH IS SHOWN FOR ROGERS R04350B,  
DIELECTRIC THICKNESS: .030"  $\pm$  .002";  
COPPER: 1/2 OZ ON EACH SIDE.  
FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.



DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK  
OVER BARE COPPER)



DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

UNLESS OTHERWISE SPECIFIED

INITIALS

DATE

DIMENSIONS ARE IN INCHES

TOLERANCES ON:

2 PL DECIMALS  $\pm$ 3 PL DECIMALS  $\pm$  .005ANGLES  $\pm$ FRACTIONS  $\pm$ 

DRAWN

DK (RAVON)

02 NOV 08

CHECKED

DH (RAVON)

02 NOV 08

APPROVED

HH (RAVON)

02 NOV 08



Mini-Circuits®

13 Neptune Avenue  
Brooklyn NY 11235

PL, 14FL03, HU1186, BPF-C  
TB-500+ (50 OHM)

SIZE

A

CODE IDENT

15542

DRAWING NO:

98-PL-294

REV:

OR

FILE:

98PL294

SCALE:

3:1

SHEET:

1 OF 1

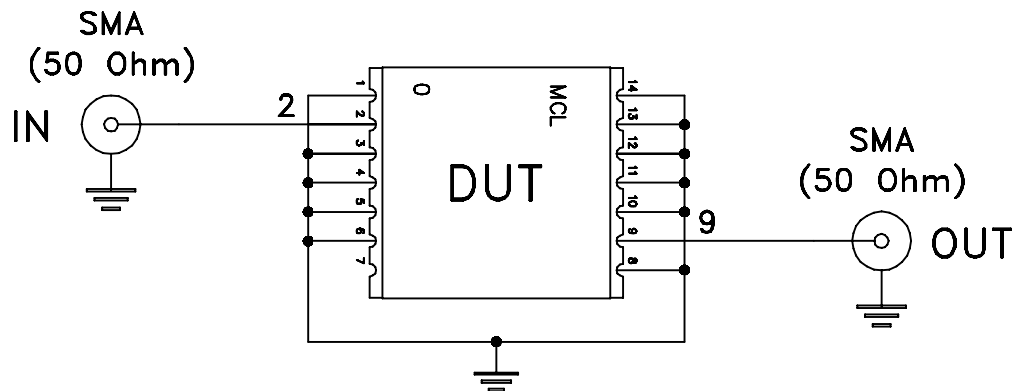
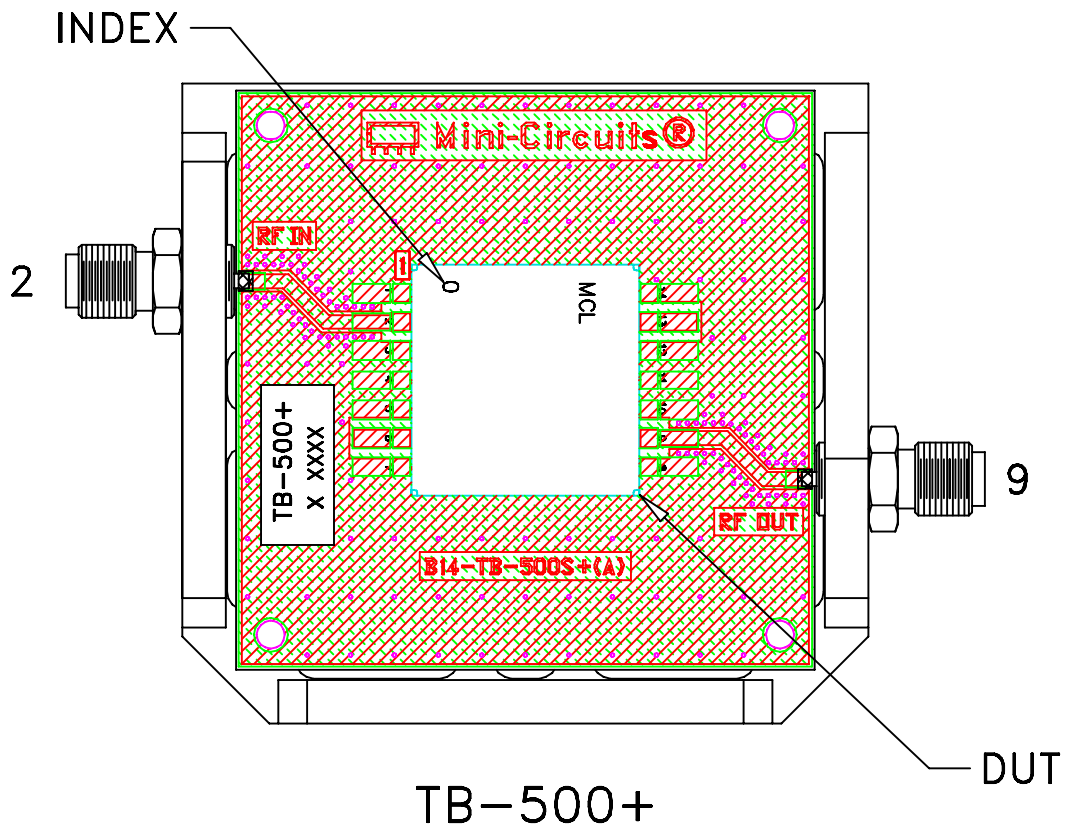
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ASHEETA1.DWG REV:A DATE:01/12/95



# Evaluation Board and Circuit



Schematic Diagram

## Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: R04350 or equivalent.  
Dielectric Constant=3.5, Thickness=.030 inch.

Mini-Circuits®



All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| Specification                 | Test/Inspection Condition                                                                                                 | Reference/Spec                                |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Operating Temperature         | -40° to 85° C<br>Ambient Environment                                                                                      | Individual Model Data Sheet                   |
| Storage Temperature           | -65° to 150° C<br>Ambient Environment                                                                                     | Individual Model Data Sheet                   |
| Autoclave                     | 15 psig, 100% RH, 121°C, 96 hours                                                                                         | JESD22-A102-C, Condition C                    |
| Temperature Cycling           | -65° to 150°C, 100 cycles                                                                                                 | JESD22-A104                                   |
| Temperature Humidity          | 85°C/ 85% RH, 168 hours                                                                                                   | JESD22-113                                    |
| Solder Reflow Heat            | Sn-Pb Eutetic Process: 240°C peak<br>Pb-Free Process: 260°C peak                                                          | J-STD-020, Table 4-1, 4-2 and 5-2; Figure 5-1 |
| Moisture Sensitivity: Level 1 | Bake at 125°C for 24 hours<br>Soak at 85°C/85% RH for 168 hours, Reflow 3 cycles at 240°C peak (Non-RoHS) or 260°C (RoHS) | J-STD-020                                     |
| Solderability                 | 10X magnification, 95% coverage                                                                                           | JESD22-B102, Method 1: Dip and Look Test      |
| Mechanical Shock              | 50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes                                                         | MIL-STD-202, Method 213, Condition A          |
| Vibration (High Frequency)    | 20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)                                       | MIL-STD-202, Method 204, Condition D          |